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**FACSIMILE TRANSMITTAL SHEET**

TO:	FROM:
Examiner Bernard E. Souw	Shirley L. Church
COMPANY:	DATE:
U.S. Patent & Trademark Office	January 18, 2005
FAX NO.	NO. PAGES, INC.
(571) 273-2482	COVER: 4
PHONE NO.	SENDER'S REF.
	NO.: AM-4913.C1
RE:	RECIPIENT'S REF. NO.:
Records from Shirley L Church file for Docket No. AM-4913.C1 dated June 22, 2004 and July 9, 2004.	Serial No. 10/803,352
<input type="checkbox"/> Urgent <input checked="" type="checkbox"/> For Review <input checked="" type="checkbox"/> Please Comment <input type="checkbox"/> Please reply <input type="checkbox"/> Confirming Copy by Mail	

## Notes/Comments:

Dear Examiner Souw:

Following this cover sheet are the notes from my file regarding our telephone interviews. The notes were in blue ink and I had to darken parts so that they could be read when I faxed it to you. At the time we were having the teleconferences, I thought we were discussing the 10/803,352 application. I had filed this application, but did not realize that you had not yet received it because it had been sent to another Examiner. Even though the application serial numbers we were discussing were different, the applications we were discussing were the same in content, with the exception of amendments which had been made to the claims in the Preliminary Amendment "A", which was filed with the continuation (10/803,352) application.

My client is willing to remove the marked out portion of Paragraph 55 as we had agreed by telephone. My client is also willing to amend claims 8, 19, and 25 in the manner which was discussed by telephone conference as well.

Would you please review the claims which are presented in the 10/803,352 Preliminary Amendment "A" and call me to discuss other changes which you might require in these claims to put them in an acceptable condition. We would be willing to do this by Examiner's amendment; or I could send in a new set of claims amended based on your final recommendations.

Thank you for your help in this matter.

*Shirley L. Church*  
Shirley L. Church

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9/22/04

Teleconference with Examiner BE Souw. He wants to do an Examiner's Amendment to remove a statement at P 55 Page 17, lines 4-6 beginning with "Moreover". See the attached notes. I contacted Bob Mulcahy who agreed that it is acceptable to remove this sentence.

The Examiner will check the claims, & if there is a distinction in the claims which is sufficient, he will allow the case.

SM

7/9/04

Teleconference with Examiner Souw. He wants to amend Claims 8, 19, & 25 to recite "for a time sufficient to regenerate said quantum efficiency of said photocathode" after "temperature" at the end of the claim. I approved the amendment.

11  
Page 70 objection  
122/04

Strong electromagnetic field

There is no connection between Fig 6 & regeneration.

Primary objection which leads to § 112

Therefore the Spec on page 17 § in the new application - need to amend.

P 005 5.

Fig. 6  $10^7$  & still maintain QE above  $\frac{4}{5}$

Because QE is . . . .

can be regenerated irrespective of whether QE goes up, this —

is a temporary condition because of saturation.

Regeneration is substantiated  
change in lattice crystal.

Diffusion process takes time.

Heat up the crystal w/o damage

& contamination will diffuse away.

QE is instantaneous - up & down.

*e beam heats better*

operating in the ultraviolet range. As shown in FIG. 6, a cesium telluride photocathode can be exposed to a power density of  $10^7$  Watts per square centimeters and still maintain a QE above 4%. Moreover, because the QE of the cesium telluride photocathode actually increases with power density, at least below a certain threshold, the photocathode can be regenerated using the laser itself. Thus, a regeneration cycle may be provided whereby the laser that is used to cause electron emission in the photocathode is used to also regenerate the photocathode.

{ Remove  
02/27/04 }

[0056] This process is shown with reference to FIG. 7. As shown, a lithography cycle 702 is implemented under control of the controller (FIG. 1). According to one implementation of the invention, if the QE of the photocathode is 10%, this is made to occur at a power density of approximately  $10^4$  Watts per square centimeter. Once QE has degraded to a predetermined degree, a regeneration cycle 704 is implemented. According to one implementation, the regeneration cycle is done at a power density of  $10^4$ - $10^6$  Watts per square centimeter at a wavelength of approximately 257 nanometers. The substrate temperature is raised about 20-200 degrees Celsius above room temperature.

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### Writing Strategy

[0057] As noted above, an aspect of the present invention is an improved writing strategy. FIG. 8 and FIG. 9 illustrate the interlaced scan strategy. Shown in FIG. 8 is a portion of the leading edge of the brush. More particularly, the first five (5) beams 802a-802e of the brush are shown for clarity. The beams 802a-802e are separated by 350 nm in the low magnification case and by 210 nm in the high magnification case. The brush is scanned in the direction perpendicular to the array 801. By the next scan, the stage has moved by 1600 nm in the low magnification case and by 960 nm in the high magnification case.

[0058] More particularly, FIG. 9 illustrates beam interlacing in greater detail. Shown are a plurality of offset brush lines 902a-902h and the single